



# *MI FluFocus*

## **Influenza Surveillance and Avian Influenza Update**

**Bureau of Epidemiology  
Bureau of Laboratories**

Michigan Department  
of Community Health



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### ***New updates in this issue:***

- **International:** Hong Kong scientists report on a reassortant swine influenza virus that had internal genes from a swine flu virus, a hemagglutinin from a Eurasian avian influenza lineage, and the neuraminidase gene from the human pandemic H1N1 virus.
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### ***\*\*\*2009 Influenza A (H1N1) virus Updates\*\*\****

Please continue to reference the MDCH influenza website at [www.michigan.gov/flu](http://www.michigan.gov/flu) for additional 2009 H1N1 information. Local health departments can find guidance documents in the MI-HAN document library. In addition, additional laboratory-specific information is located at the Bureau of Laboratories H1N1 page at [http://www.michigan.gov/mdch/0,1607,7-132-2945\\_5103-213906--,00.html](http://www.michigan.gov/mdch/0,1607,7-132-2945_5103-213906--,00.html).

### ***\*\*\*Influenza Surveillance Reports\*\*\****

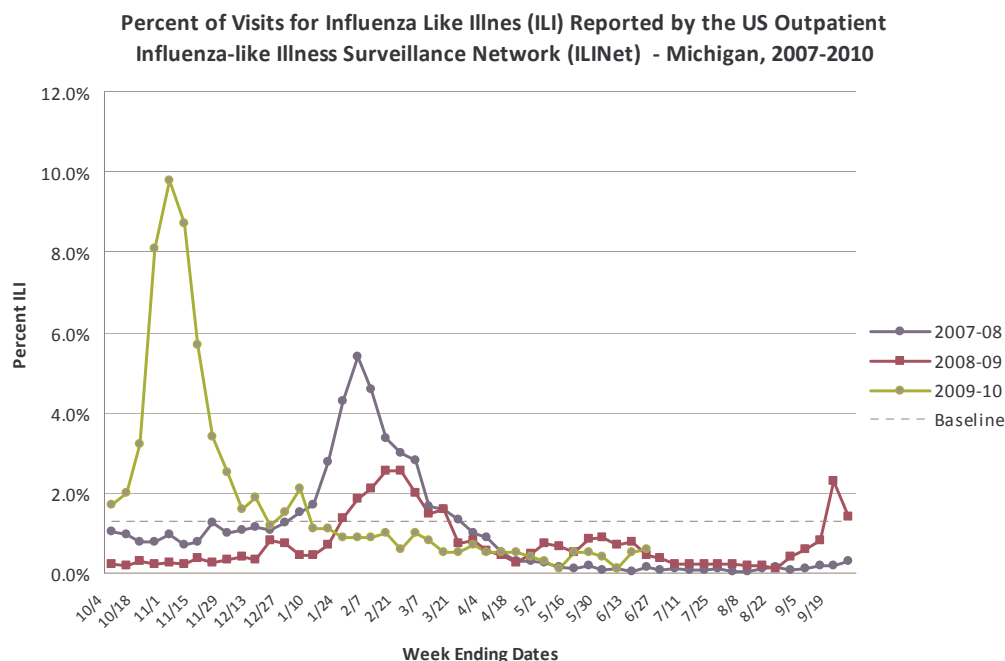
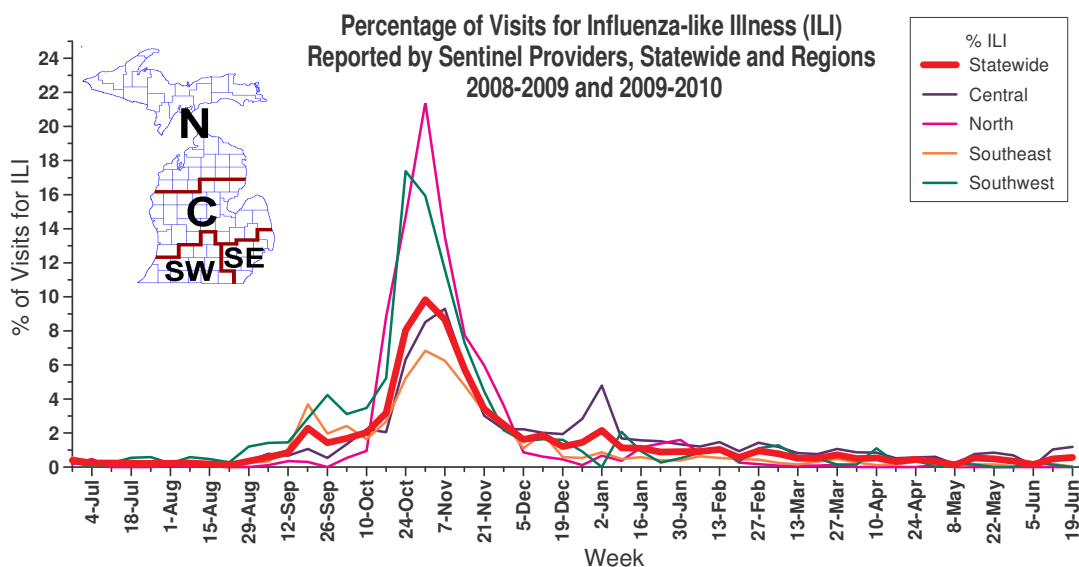
**Michigan Disease Surveillance System:** MDSS data for the week ending June 19th showed that aggregate influenza case reports continued decreasing to levels normally seen after schools dismiss for summer vacation. Individual reports, including influenza and 2009 novel influenza cases, remained near the previous week's reported levels of little to no activity. Aggregate influenza cases are similar to levels seen during the same reporting period in 2009, while individual influenza reports are drastically lower. The decrease in individual reports is attributable to the rapid increase of cases in 2009 due to the H1N1 pandemic; current levels are consistent with expected levels based on surveillance data from previous non-pandemic influenza seasons.

**Emergency Department Surveillance:** Emergency department visits from constitutional complaints were comparable to the previous week's levels, while respiratory complaints decreased slightly. Both constitutional and respiratory complaints are at similar levels compared to the same reporting period last year. In the past week, there were four constitutional alerts in the SE(1), SW(1), C(1), and N(1) Influenza Surveillance Regions. There were eight respiratory alerts in the C(6) and N(2) Influenza Surveillance Regions.

**Over-the-Counter Product Surveillance:** Over the past week, OTC product sales of thermometers, pediatric electrolytes, and cough/cold aides, and remained similar to last week's levels, while chest rubs experienced a slight decrease. All indicators are consistent with levels seen at this time last year, except for chest rubs, which are slightly increased.

**Sentinel Provider Surveillance (as of June 24):** During the week ending June 19, 2010, the proportion of visits due to influenza-like illness (ILI) slightly increased to 0.6% overall. Thirty-nine patient visits due to ILI were reported out of 6,817 office visits. Twenty-three sentinel sites provided data for this report, limiting the validity of the slight increase. Activity increased in one surveillance region: Central (1.2%) and no ILI activity was reported in the remaining three regions: Southeast, Southwest and North. Please note that these rates may change as additional reports are received.

As part of pandemic influenza surveillance, CDC and MDCH highly encourage year-round participation from all sentinel providers. New practices are encouraged to join the sentinel surveillance program today! Contact Cristi Carlton at 517-335-9104 or [CarltonC2@michigan.gov](mailto:CarltonC2@michigan.gov) for more information.



**Laboratory Surveillance (as of June 19):** During June 13-19, MDCH Bureau of Laboratories identified no influenza isolates. For the 2009-2010 season (starting on October 4, 2009), MDCH BOL has identified 610 influenza isolates:

- 2009 Influenza A (H1N1): 609
- Influenza B: 1

Seven sentinel laboratories reported for the week ending June 19, 2010. All laboratories (SE, SW, C, N) reported no influenza A or B positive test results, with very few specimens being tested.

**Michigan Influenza Antigenic Characterization (as of June 24):** One 2009 H1N1 influenza A virus from Michigan has undergone further characterization at the CDC. This virus was characterized as A/California/07/2009 (H1N1)-like, which is the recommended strain for the H1 component of the 2010-11 Northern Hemisphere vaccine.

**Michigan Influenza Antiviral Resistance Data (as of June 24):** Results are currently not available for antiviral resistance at CDC for the 2009-2010 season.

Antiviral resistance testing takes months to complete and cannot be used to guide individual patient treatment. However, CDC has made recommendations regarding the use of antivirals for treatment and prophylaxis of influenza. The guidance is available at <http://www.cdc.gov/H1N1flu/recommendations.htm>.

**Influenza-Associated Pediatric Mortality (as of June 24):** Five 2009 H1N1 influenza-associated pediatric mortalities (SE(3), SW, N) have been reported to MDCH for the 2009-2010 influenza season.

\*\*\*CDC has asked states for information on any pediatric death associated with influenza. This includes not only any pediatric death (<18 years) resulting from a compatible illness with laboratory confirmation of influenza, but also any unexplained pediatric death with evidence of an infectious process. Please immediately call MDCH to ensure proper specimens are obtained. View the complete MDCH protocol online at [http://www.michigan.gov/documents/mdch/ME\\_pediatric\\_influenza\\_guidance\\_v2\\_214270\\_7.pdf](http://www.michigan.gov/documents/mdch/ME_pediatric_influenza_guidance_v2_214270_7.pdf).

**Influenza Congregate Settings Outbreaks (as of June 24):** Seven congregate setting outbreaks with confirmatory novel influenza A H1N1 testing (2SE, 3 SW, 1C, 1N), and three outbreaks associated with positive influenza A tests (2C, 1N) have been reported to MDCH for the 2009-2010 influenza season. These are 8 school facilities and 2 long term care facilities. Human metapneumovirus was confirmed in one outbreak in a long term care facility (SW) in February. Adenovirus was confirmed from one outbreak in an elementary school (SW) in May.

During fall 2009, 567 influenza-related school and/or district closures in Michigan (Public Health Preparedness Region 1 - 55, Region 2N - 4, Region 2S - 8, Region 3 - 54, Region 5 - 153, Region 6 - 100, Region 7 - 109, Region 8 - 84) were reported.

**National:** To access previous Center for Disease Control and Prevention weekly surveillance reports, visit <http://www.cdc.gov/flu/weekly/fluactivity.htm>.

**International (WHO Pandemic update 105 [edited], June 18):** The situation remains largely unchanged since the last update. Overall pandemic influenza activity remains low worldwide with geographically limited circulation in parts of the tropics, particularly in parts of Central America and the Caribbean and in parts of South and Southeast Asia. Seasonal influenza B viruses continue to circulate at low levels across Asia and to a lesser extent across parts of Africa and South America. Recently re-emerged seasonal H3N2 viruses continue to circulate in East Africa. As countries of the temperate southern hemisphere enter winter, overall only sporadic influenza activity has been detected so far.

In tropical region of the Americas, low or waning circulation of pandemic virus has been primarily reported in Costa Rica (since early 2010) and in Cuba (last reported at the end of May 2010), respectively. In Cuba and to a lesser extent in Costa Rica, recent pandemic influenza activity has been associated with small numbers of fatal cases. In Colombia, during the first week of June 2010, an increasing trend of respiratory diseases was associated with regional spread of pandemic influenza activity and a small number of new fatal cases, likely reflecting increasing but low level circulation of pandemic influenza virus. Throughout the rest of the region, there have been only sporadic detections of pandemic influenza virus during the past month. In several countries of the region, there has been recent circulation of seasonal influenza viruses including type A (Venezuela since May 2010) and B (Bolivia since March 2010). Throughout the region there has been variable ongoing co-circulation of other respiratory viruses, particularly RSV.

In Asia, pandemic influenza virus continues to actively circulate in Malaysia, Singapore, and to a much lesser extent in parts of India, Bangladesh, and Bhutan. In Malaysia, limited data suggest that virus transmission persists but continues to decline; the number of new cases reported per week plateaued during mid-April 2010 and began to decline at the end of May 2010. In Singapore, during the second week of June 2010, the levels of ARI remained near the warning level but below the epidemic threshold; approximately 28% of respiratory samples from patients with ILI tested positive for pandemic influenza virus. In South Asia, low level circulation of pandemic influenza virus has persisted in western India (since early 2010) and Bangladesh (since late February 2010); in India but not Bangladesh, regional, low intensity transmission during 2010 has been associated with small numbers of fatal cases over time. Seasonal influenza type B viruses continue to co-circulate with pandemic influenza virus in Bangladesh and have only recently emerged and become predominant in India, although at low levels. Of note, there have been recent media reports of increasing pandemic influenza activity in the southern Indian state of Kerala and more information is expected to become available soon. In Bhutan, there have been recent reports of school outbreaks of pandemic influenza virus infection in three separate areas of the country, however, the overall intensity of respiratory diseases in the population was reported to be low.

In Sub-Saharan Africa, pandemic influenza virus continued to circulate at low levels in limited areas of East and West Africa. During the first week of June 2010, 10% and 16% of all respiratory samples tested positive for pandemic influenza virus in Tanzania and Ghana, respectively. Small but significant numbers of seasonal H3N2 viruses continue to be detected in Kenya and Tanzania since late May 2010.

Overall, in the temperate regions of the northern hemisphere, pandemic influenza viruses have been detected only sporadically during the past month. In the temperate southern hemisphere, only two countries, Chile and Uruguay, have recently reported small numbers of pandemic influenza detections. Other respiratory viruses, most notably RSV, are known to be circulating in Chile and Argentina. During the first two weeks of June 2010, small numbers of seasonal influenza H3N2 and type B viruses have been detected in South Africa. In New Zealand and Australia, overall levels of ILI remain low; only sporadic detections of seasonal and pandemic influenza viruses have been recently reported in Australia.

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Weekly reporting of influenza activity to the CDC has concluded for the 2009-2010 season.

For those interested in additional influenza vaccination and education information, the MDCH *FluBytes* is available at [http://www.michigan.gov/mdch/0,1607,7-132-2940\\_2955\\_22779\\_40563-125027--,00.html](http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_40563-125027--,00.html).

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### ***Novel Influenza Activity and Other News***

**WHO Pandemic Phase:** Phase 6 – characterized by increased and sustained transmission in the general population. Human to human transmission of an animal or human-animal influenza reassortant virus has caused sustained community level outbreaks in at least two WHO regions.

**International, Swine (The Canadian Press, June 17):** Scientists from Hong Kong are calling for ramped-up surveillance of pig populations after discovering a new swine flu virus that is a hybrid of the pandemic H1N1 virus and viruses previously found in pigs.

The discovery of the virus, found early this year in a pig taken to slaughter in Hong Kong, suggests what experts have feared: the H1N1 virus may reassort easily with other viruses in pigs.

That's a process that could generate new flu viruses that might have the capacity to sicken humans, they warned, noting two viruses high on the pandemic watch list — H5N1 and H9N2 — are occasionally found in swine in Asia.

Inherent in their report is a message flu experts know the world doesn't want to hear at this point: the mild H1N1 pandemic may be the opening act of a longer play.

"This particular paper is extremely interesting because it demonstrates for the first time what we had worried about at the very onset of the pandemic," said Dr. Nancy Cox, head of the influenza division at the U.S. Centers for Disease Control. "And that is that this particular virus, when introduced into pigs, could reassort with the resident viruses in pigs and we would have new gene constellations. And bingo, here we are."

The discovery was reported by scientists from the University of Hong Kong and Shantou University Medical College in Guangdong province, China. It was published Friday in the journal *Science*.

It is the first report of a reassortment of the pandemic virus, which in humans has been slow to evolve. Cox said surveillance shows little significant variation in the viruses isolated from people and no need yet to update the virus used to make human flu vaccine.

Pigs are called the mixing vessel of flu because they can be infected both by avian flu viruses — which rarely directly infect people — and by human viruses. When pigs become simultaneously infected with more than one virus, the viruses can swap genes, producing new variants that can pass to humans and sometimes spread among them.

"Unlike the situation with birds and humans, we have a situation with pigs and humans where there's a two-way street of exchange of viruses," said Cox, who was not involved in the Hong Kong study. "With pigs it's very much a two-way street."

One of the senior authors of the paper said the fact the first reassortant involving pandemic H1N1 has been found in swine underscores the role the animals play. Over the past year, especially in the early days of the pandemic, H1N1 would have had plenty of opportunities to reassort with human flu viruses in people, Dr. Malik Peiris said.

"It has been in pigs for a much shorter time and as far as we can tell to a more limited extent and already we can detect a reassortant. So it suggests — although the numbers are very small yet — that probably it

is not difficult really for the pandemic virus to reassort with other pig viruses," said Peiris, a microbiologist at the University of Hong Kong.

The discovery was made through a surveillance system his team has operated for the past decade. Every two weeks they swab the snouts of about 250 pigs at an abattoir just after the animals have been slaughtered. The vast majority of the pigs slaughtered there come from adjacent provinces in China. Late last October, they started finding pandemic H1N1 viruses in some of the pigs. Those viruses appeared to be the product of human-to-pig transmission, Peiris explained in an interview.

But in early January, one of the swabbing forays produced a novel finding — a virus that had internal genes from one line of swine flu viruses, a hemagglutinin from a Eurasian avian flu lineage and the neuraminidase gene from the human pandemic H1N1.

There is no evidence the virus is continuing to spread or that it is inherently more virulent than H1N1. But if it were to find its way to humans, it would likely cause infection. Testing shows the antibodies generated by H1N1 infection or by the pandemic vaccine would not protect against this virus.

Dr. Christopher Olsen, a swine flu expert from the University of Wisconsin-Madison, said he found it striking that of 32 H1 viruses isolated from pigs from June 2009 to February 2010, 10 were pandemic viruses.

Scientists in the swine flu community have been questioning whether pandemic H1N1, which has been found in pigs in multiple countries around the world, would become established as one of the circulating viruses in herds, he said.

"And I think this really does speak to the fact that it's very likely that this virus is becoming endemic within at least this particular swine population," said Olsen, who suggested if that does happen, it will likely give rise to new hybrid viruses. "In an area of the world where you have multiple genotypes of virus co-circulating in the swine population, you would really expect reassortment to happen."

Cox, who has long called for more influenza surveillance in swine herds, was quick to echo the authors' recommendation for more work in this area. But she, Peiris and Olsen all acknowledged there is likely to be resistance to the suggestion.

In fact, flu experts have been worried that since the emergence of H1N1, surveillance in pigs has probably declined. Pig producers have learned that finding flu viruses in their herds can have costly consequences.

Arnold Van Ginkel, a farmer who lives near Rocky Mountain House, Alta., had the great misfortune of owning the first pigs to test positive for the pandemic virus anywhere in the world. He eventually had to destroy the herd because no one would buy his animals, even after they recovered fully from their bout of flu.

Some countries closed their borders to imports of pork from countries where the virus had been found in pigs — even though those same countries had human cases of H1N1 and even though experts insisted there was no risk of acquiring the virus from properly handled pork products.

Cox said a way needs to be found to do surveillance in a smarter way, in a way "that doesn't punish the innocent." She said the U.S. is working on a system whereby surveillance data could be anonymous so that a finding could not be traced publicly to an individual farm.

**Michigan Wild Bird Surveillance (USDA, as of June 24):** For the 2010 season (April 1, 2010-March 31, 2011), highly pathogenic avian influenza H5N1 has not been recovered from 1,899 samples tested nationwide, including 4 Michigan samples (1 live bird, 2 hunter-killed birds, 1 morbidity/mortality). For more information, visit the National HPAI Early Detection Data System at <http://wildlifedisease.nbii.gov/ai/>.

To learn about avian influenza surveillance in Michigan wild birds or to report dead waterfowl, go to Michigan's Emerging Disease website at <http://www.michigan.gov/emergingdiseases>.

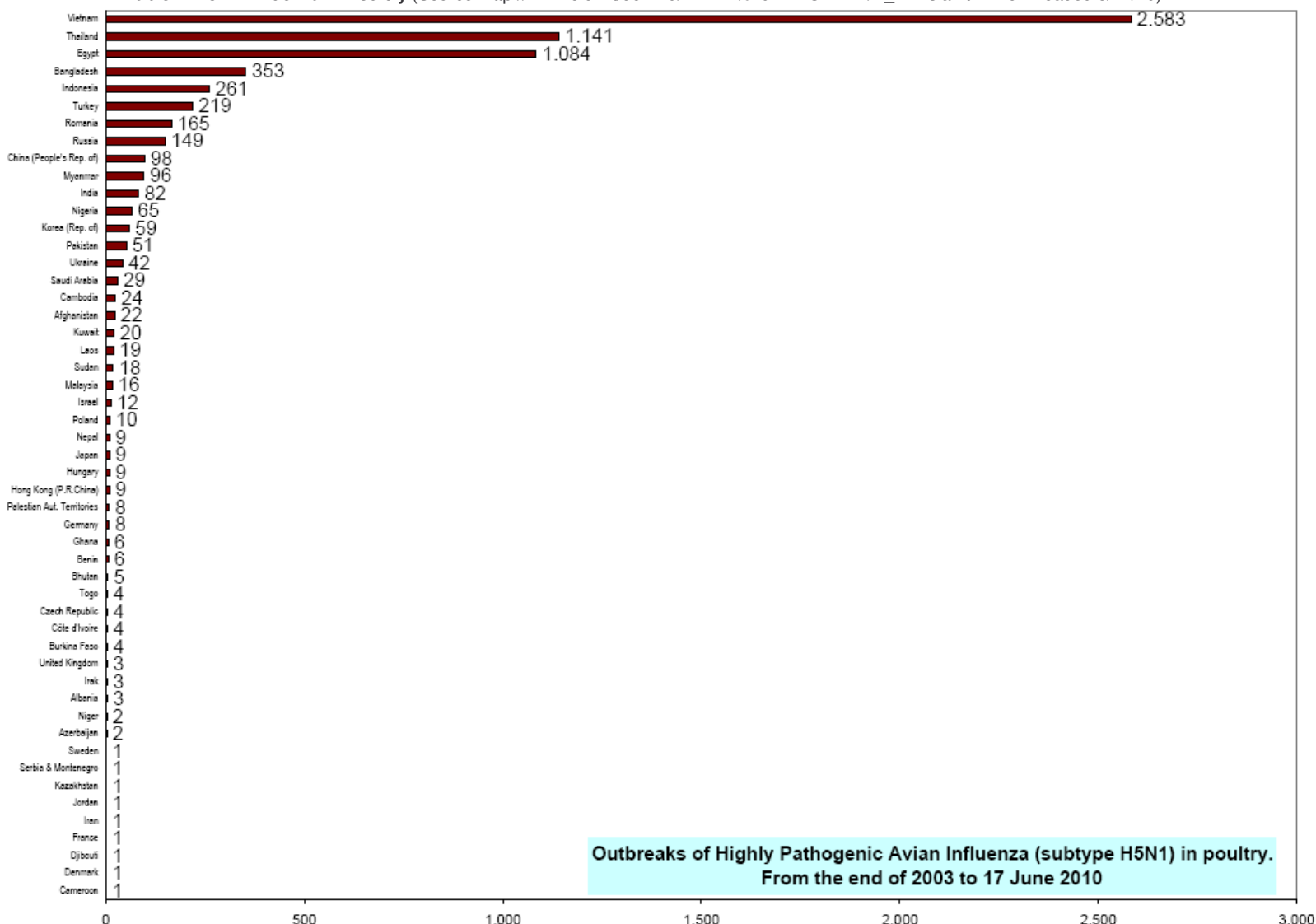
**For questions or to be added to the distribution list, please contact Susan Peters at [PetersS1@michigan.gov](mailto:PetersS1@michigan.gov)**

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**Table 1. H5N1 Influenza in Poultry** (Source: [http://www.oie.int/downld/AVIAN%20INFLUENZA/A\\_AI-Asia.htm](http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm) Downloaded 6/24/10)



**Outbreaks of Highly Pathogenic Avian Influenza (subtype H5N1) in poultry.**  
From the end of 2003 to 17 June 2010

**Table 2. H5N1 Influenza in Humans - Cases up to May 6, 2010.** [http://www.who.int/csr/disease/avian\\_influenza/country/cases\\_table\\_2010\\_06\\_08/en/index.html](http://www.who.int/csr/disease/avian_influenza/country/cases_table_2010_06_08/en/index.html). Downloaded 6/14/2010. Cumulative number of lab-confirmed cases reported to WHO. Total cases includes deaths.

Country	2003		2004		2005		2006		2007		2008		2009		2010		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Cambodia	0	0	0	0	4	4	2	2	1	1	1	0	1	0	1	1	10	8
China	1	1	0	0	8	5	13	8	5	3	4	4	7	4	1	1	39	26
Djibouti	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	25	9	8	4	39	4	19	7	109	34
Indonesia	0	0	0	0	20	13	55	45	42	37	24	20	21	19	3	2	165	136
Iraq	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Nigeria	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
Pakistan	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	3	1
Thailand	0	0	17	12	5	2	3	3	0	0	0	0	0	0	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	0	0	0	0	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	8	5	6	5	5	5	7	2	119	59
Total	4	4	46	32	98	43	115	79	88	59	44	33	73	32	31	13	499	295